

## ARISE - C-130 Hercules 09/17/14 Science Report

**Aircraft:**

[C-130H Hercules #439](#) ([See full schedule](#))

**Date:**

Wednesday, September 17, 2014

**Mission:**

ARISE

**Mission Location:**

Arctic Ocean

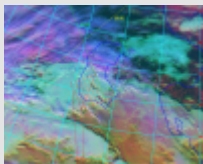
**Mission Summary:**

CERES Gridbox - Flt #11

The objectives for today's flight were to characterize the surface radiation budget over mostly open ocean surface conditions near the sea-ice edge with a low altitude lawnmower pattern in a 100x100 km grid box (centered near 74N 153W), to characterize cloud radiative and microphysical properties, to obtain a profile of atmospheric state and to conduct a brief survey of the radiation budget from high altitude over the grid box before returning to Fairbanks. The cloud situation was complex. From satellite data, five different layers were discernible across the area. The C-130 encountered four of these inside the grid box. Cirrus clouds were present above the altitude ceiling of the C-130 in the northern corner. Descending through the clouds, three more layers at 17000ft, 6000ft and the bottom layer at 1500ft were sampled. There was some difficulty getting below the lowest cloud layer which hovered around 500 ft but sometimes extended lower. The downward facing instruments were able to see the surface at times making measurements of the upwelling radiation and surface temperatures. The surface was a mixture of open water with patches of broken sea ice, with concentrations occasionally up to ~30%. Surface temps varied from between -0.5C and -2.0C. At times when the C-130 was unable to get below the lowest cloud ceiling, the grid box legs were flown above the lowest cloud layer, occasionally descending into the cloud and near the base to get in-situ cloud sampling and surface measurements. Above the lowest cloud layer the conditions were overcast and very uniform. On the ascent near the end of the flight, the higher cloud layers were sampled. All of the instruments were reported to work well and data were acquired in the grid?box during an NPP, Aqua and Terra overpass. An under-flight of CALIPSO was also conducted as it passed overhead. These data will help test and improve the CERES gridded cloud and radiation products being used by scientists worldwide to help improve our understanding of cloud radiative effects as sea ice conditions are changing due to arctic warming.

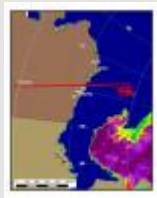
**Images:**

### September 17, 2014 Figure 1



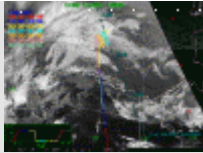
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### September 17, 2014 Figure 2



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### September 17, 2014 Figure 3



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## September 17, 2014 Figure 4



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## September 17, 2014 Figure 7



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### Submitted by:

William L. Smith Jr. on 09/18/14

### Related Flight Report:

## C-130 Hercules 09/17/14 - 09/18/14

### Flight Number:

CERES Gridbox - Flight #11

### Payload Configuration:

ARISE

### Nav Data Collected:

Yes

### Total Flight Time:

7.2 hours

### Submitted by:

Martin Nowicki on 09/17/14

**Flight Segments:**

<b>From:</b>	PAEI	<b>To:</b>	PAEI
<b>Start:</b>	09/17/14 18:15 Z	<b>Finish:</b>	09/18/14 01:27 Z
<b>Flight Time:</b>	7.2 hours		
<b>Log Number:</b>	<a href="#">141002</a>	<b>PI:</b>	Christy Hansen
<b>Funding Source:</b>	Bruce Tagg - NASA - SMD - ESD Airborne Science Program		
<b>Purpose of Flight:</b>	Science		

**Flight Hour Summary:**

	141002	151004
<b>Flight Hours Approved in SOFRS</b>	229	
<b>Flight Hours Previously Approved</b>		88.7
<b>Total Used</b>	140.3	18.2
<b>Total Remaining</b>		70.5

**151004 Flight Reports**

Date	Flt #	Purpose of Flight	Duration	Running Total	Hours Remaining
<a href="#">10/02/14 - 10/03/14</a>	Cal Flight	Science	8.6	8.6	80.1
<a href="#">10/04/14</a>	Transit	Transit	9.6	18.2	70.5

**Source URL:** [https://airbornescience.nasa.gov/science\\_reports/ARISE\\_-\\_C-130\\_Hercules\\_09\\_17\\_14\\_Science\\_Report](https://airbornescience.nasa.gov/science_reports/ARISE_-_C-130_Hercules_09_17_14_Science_Report)

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*Flight Reports began being entered into this system as of 2012 flights. If there were flights flown under an earlier log number the flight reports are not available online.*

**141002 Flight Reports**

Date	Flt #	Purpose of Flight	Duration	Running Total	Hours Remaining
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<a href="#">08/24/14</a>	Engineering Check Flight	Check	2.8	2.8	226.2
<a href="#">08/29/14</a>	Boom Calibration Flight	Check	0.5	3.3	225.7
<a href="#">08/30/14</a>	Project Check Flight	Check	5.2	8.5	220.5
<a href="#">09/01/14</a>	Transit (1 of 2)	Transit	8.7	17.2	211.8
<a href="#">09/02/14</a>	Transit (2 of 2)	Transit	6.6	23.8	205.2
<a href="#">09/04/14 - 09/05/14</a>	Arctic Ocean - Flight #1	Science	6.6	30.4	198.6
<a href="#">09/05/14 - 09/06/14</a>	140W Sea Ice - Flight #2	Science	7.1	37.5	191.5
<a href="#">09/06/14 - 09/07/14</a>	Ice ZigZag-Terra - Flight #3	Science	7.1	44.6	184.4
<a href="#">09/07/14 - 09/08/14</a>	CERES Gridbox - Flight #4	Science	8.4	53	176
<a href="#">09/09/14 - 09/10/14</a>	CERES Gridbox - Flight #5	Science	7.7	60.7	168.3
<a href="#">09/10/14 - 09/11/14</a>	MIZ Lawnmower - Flight #6	Science	8.8	69.5	159.5
<a href="#">09/11/14 - 09/12/14</a>	CERES Gridbox - Flight #7	Science	7.5	77	152
<a href="#">09/13/14 - 09/14/14</a>	CERES Gridbox - Flight #8	Science	8.3	85.3	143.7
<a href="#">09/15/14 - 09/16/14</a>	CERES Gridbox - Flight #9	Science	8.1	93.4	135.6
<a href="#">09/16/14 - 09/17/14</a>	Radiation Wall Pattern - Flight #10	Science	8.3	101.7	127.3
<a href="#">09/17/14 - 09/18/14</a>	CERES Gridbox - Flight #11	Science	7.2	108.9	120.1
<a href="#">09/18/14 - 09/19/14</a>	Sea Ice Albedo/CryoSat - Flight #12	Science	8.6	117.5	111.5
<a href="#">09/19/14 - 09/20/14</a>	Radiation Wall Pattern - Flight #13	Science	8.3	125.8	103.2
<a href="#">09/21/14 - 09/22/14</a>	Sea Ice & Radiation - Flight #14	Science	8.2	134	95
<a href="#">09/24/14 - 09/25/14</a>	Gridbox TOA+Surface - Flight #15	Science	6.3	140.3	88.7